

# Rhodora

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A PLUMOSE VARIETY OF THE EBONY SPLEENWORT.

GEORGE E. DAVENPORT.

(Plate 22.)

*ASPLENIUM EBENEUM*, Aiton, var. *Hortonae*, n. var. — Habit and rootstock as in the specific form. Fronds in two series as in normal forms; lower series smallest, rosette-like in arrangement, reclining in position, normally sterile, with closely set, more or less imbricated, alternate pinnae; larger series taller, erect, abnormally sterile, with more distinct, alternate, sessile, sub-sessile or short-stalked, obliquely incised or deeply pinnatifid obtuse pinnae, the oblique lobes cuneate and coarsely serrated, the basal lobes often distinct, the upper one the largest and somewhat auriculate; laminae  $\frac{1}{2}$  to 2 inches broad, pinnate nearly to the pinnatifid acute apex, lower portion abruptly diminished, the reduced pinnae lobed, or divided, and wholly different from the reduced simpler lobes of the normal forms. Stipe short, and, as well as the rhachis, vivid chestnut, or reddish brown, glossy, terete, or obscurely furrowed along the face in the living plant, shrivelling in drying and then appearing as if striated; clothed at the base with a few delicate linear-acuminate, ciliated, transparent scales with a central framework of brown, and containing two small vascular bundles that shortly coalesce into one; veins flabellately forked in the basal lobes, the whole system forming what Luerssen terms "Nervatio Sphenopteridis" in which some of the pinnae resemble sections of *Asplenium Adiantum-nigrum*.

This remarkable and most beautiful variety of the Ebony Spleenwort was found growing on limestone cliffs in company with typical *Asplenium ebeneum* and *A. Trichomanes* by Mrs. Frances B. Horton, at Brattleboro, Vermont, in September, 1900. It presents an appearance so striking that at first I was inclined to regard it as a new species.

Its lines of variation are, it is true, in the direction of a natural disposition on the part of even typical forms to become more or less serrated, but in the present instance this has been carried so far in the oblique incisions and lobings, and overlapping of the segments, that the normal form is completely lost sight of and in those fronds with closely imbricated pinnae the whole lamina has a beautifully frilled appearance that suggests some forms of *Asplenium lunulatum*, Swartz.

Coarsely serrated fronds of *A. ebeneum* are not infrequently found, especially in some of the highly developed southern forms with the pinnae conspicuously lobed, and a very remarkable form was collected in Maine several years ago by Miss Kate Furbish, but nothing like the present form, in which the change is so great as to render the plant almost unrecognizable, has ever been recorded.

Mrs. Horton is to be congratulated on so interesting a discovery, and it is to be hoped that she may be rewarded still further another season by finding fertile fronds. To judge from the plants already received this form must have been in existence several years, as the annual growth and decay are easily traced on the rootstock. I owe to the courtesy of Dr. Robinson the privilege of publishing this account as he placed in my hands the original specimen, received from Mrs. Horton, to whom I am also under obligations for an additional supply of necessary material. I am likewise indebted — and the readers of RHODORA no less so — to Miss Margaret Slosson for her kindness in preparing the plate which illustrates this account.<sup>1</sup>

EXPLANATION OF PLATE 22.—*Asplenium ebeneum*, var. *Hortoniae*; fig. 1, habitual sketch; fig. 2, scale from base of stipe (magnified); fig. 3, lower pinna; fig. 4, one of the principal pinnae. Var. *serratum*, Gray in litt. and in herb. Davenport (Mass. Hort. Soc. 1872); fig. 5, a pinna from the original specimen collected by myself in 1872. *Asplenium ebeneum* (typical); fig. 6, a normal pinna.

MEDFORD, MASSACHUSETTS.

<sup>1</sup> The name *Asplenium ebeneum* was first published by William Aiton in *Hortus Kewensis*, Vol. III. p. 462, London, 1789, with the following description "fronde pinnata: pinnis lanceolatis subpaleatis serratis basi auriculatis, stipite laevissimo simplici." The date usually assigned for this publication is 1793, but the imprint on the title page of the copy in the Massachusetts Horticultural Society's Library is 1789.

## THE GENUS SENEPIO IN NEW ENGLAND.

J. M. GREENMAN.

AMONG the flowering plants there are few genera more widely distributed throughout North America than is the genus *Senecio*. In New England the indigenous species with but one exception (*S. Pseudo-Arnica*, Less.) all belong to the same natural group, and exhibit very close affinity.

The first species of this genus to be described from North America were *S. aureus* L., *S. Balsamitae*, and *S. obovatus*, Muhl. These were followed by the publication of other Atlantic species by Michaux, Pursh and other prominent botanists. Nearly all of these early described species, however, were later regarded either as identical with *S. aureus*, L., or as varieties or forms of the same. By more recent authors certain of these earlier species have been reinstated, and seemingly very justly so.

After a somewhat extended study of a representative collection of plants from different parts of North America, aided by a comparison with the originals in the older herbaria, the writer has been led to the adoption of a somewhat intermediate course in the disposition of the species of this particular group, as well as in the treatment of the North American species as a whole. It is hoped that the complete results may be brought forward at an early date; but it is thought that a synopsis of all the forms which are at present known to occur in New England may be of sufficient interest to merit publication.

The synopsis herewith presented is based entirely upon the macroscopic or more evident characters; and while now and then puzzling forms occur, yet in the main the specific limitations are tolerably constant. It should, however, be borne in mind that in any group of plants where the foliage is subject to such variation as in this particular group of *Senecios*, as complete specimens as possible should be obtained for satisfactory identification. The following are the species and varieties as now recognized for New England:

\* Indigenous species: heads conspicuously radiate.

+ Heads large, 2 cm. or more high: stems leafy throughout.

i. PSEUDO-ARNICA, Less. Stems 1 to 6 dm. high, more or less

floccosely white-tomentose especially above: leaves oblong-lingulate, 5 to 20 cm. long, 1 to 6 cm. broad, sessile, half-clasping by a subauriculate base, or the lowermost narrowed below into a winged petiolar base, obtuse or rounded at the apex, entire or unequally dentate, usually green and glabrous above, densely white-tomentose beneath: heads large, including the rays 3 to 6 cm. in diameter: involucre calyculate with linear-attenuate or subsetaceous bracteoles: achenes glabrous.—*Linnaea*, vi. 240; Hook. Fl. Bor.-Am. i. 334, t. 113; Gray, Syn. Fl. i. part 2, 384; Britton & Brown, Ill. Fl. iii. 476, f. 4033; Watson & Coulter in Gray, Manual, ed. 6, 294.—Coast of New Brunswick, Grand Manan, *A. E. Verrill*, no. 3. Reported from the adjacent coast of MAINE.

+ + Heads medium-sized, about 1 cm. or less high: stems not leafy throughout.

++ Lower leaves all broad-ovate, cordate, rather large.

2. *S. AUREUS*, L. Stems erect from rather slender rootstocks, 3 to 6 dm. high, and at first as well as the foliage often more or less floccose-tomentose, later, except for a trace of tomentum in the axils of the leaves and in the inflorescence, essentially glabrous: lower leaves long-petioled, ovate-rotund to slightly ovate-oblong, 1.5 to 8 cm. long, two thirds as broad, crenate-dentate; caulin leaves lyrate to laciniate-pinnatifid, the uppermost sessile and amplexicaul: achenes glabrous.—Sp. ii. 870, & ed. 2, 1220; Gray, Syn. Fl. i. part 2, 391; Watson & Coulter, l. c. 293; Britton & Brown, Ill. Fl. iii. 480, f. 4047.—MAINE, valley of Limestone River, *Fernald* no. 2403; Blaine, *Fernald*, no. 2404; Easton, *Fernald* (coll. of 29 June, 1899); North and South Berwick, *Parlin & Fernald*; South Berwick, *Parlin*; Fayette and Presque Isle, *Miss Kate Furbish*: NEW HAMPSHIRE, Jaffrey, *Robinson*, no. 590; Greenville, *Fernald* (coll. of 6 June, 1897): VERMONT, Manchester, *Miss Mary A. Day*, no. 102: MASSACHUSETTS, vicinity of Boston, *Wm. Boott*, etc.: RHODE ISLAND, *Thurber*; near Providence, *Collins* (coll. of 24 May, 1891): CONNECTICUT, Southington, *Bissell* no. 343.

++ ++ Lower leaves chiefly long-lanceolate from a subcordate to an abruptly contracted base, only the earliest ovate-rotund, and these small.

3. *S. ROBBINSII*, Oakes. Stems strict, 5 to 7 dm. high, striate, glabrous above, slightly tomentose at the base: the first leaves small, ovate-rotund to ovate-oblong, 1 to 3 cm. long, from two thirds to nearly as broad, crenate-dentate; the later fully developed radical and lower-stem leaves long petiolate, lanceolate to slightly oblong-lanceolate, 3 to 10 cm. long, 1.5 to 3 cm. broad, acute, rather sharply and somewhat unequally dentate-serrate, glabrous upon either surface,

slightly tomentose along the margins of the sheathing petioles; the uppermost sublyrate to more or less lacinately pinnatifid, sessile and somewhat clasping: inflorescence cymose-corymbose: achenes glabrous. — Oakes ex Rusby in Bull. Torr. Club, xx. 19, t. 139; Britton & Brown, Ill. Fl. iii. 480, f. 4046. *S. aureus*, var. *Robbinsii*, Gray ex Rusby, l. c., *S. aureus*, var. *lanceolatus*, Oakes, Hovey's Mag. vii. 183; Torr. and Gray, Fl. ii. 442; Gray, Manual, 240; not *S. lanceolatus*, Torr. & Gray, l. c., 440. *S. aureus*, var. *Balsamitae*, Watson and Coulter, l. c. in part. — MAINE, region about Moosehead Lake, *Fernald*, no. 272; along St. John River, *Fernald* (coll. of 24 July, 1893); valley of Mattawamkeag River, *Fernald*, no. 2649; valley of Sandy River, *Fernald* (coll. of 9 July, 1896); Hartford, *Parlin* (coll. of July 1892); Orono, *Fernald* (coll. of 30 June, 1893); East Livermore, *Miss Kate Furbish* (coll. of June, 1888); Farmington, *C. H. Knowlton* (coll. of 21 June, 1893); NEW HAMPSHIRE, Jackson, *H. A. Purdie* (coll. of 10 September, 1896); White Mountains, Crawford Notch, *E. & C. E. Faxon* (coll. of 7 July, 1878), Greenman, no. 1105; VERMONT, Willoughby Lake, *Walter Deane* (coll. of 26 July, 1885); Middlebury, *Brainerd* (coll. of 23 and 25 June, 1883).

++ ++ + Lower leaves obovate to oblong-ob lanceolate or subspatulate and gradually narrowed at the base (rarely rotund or oblong).

= Lower leaves obovate, or obovate-rotund.

4. *S. OBOVATUS*, Muhl. Stems erect, 3 to 6 dm. high, slightly tomentose at the base and in the axils of the leaves, soon glabrate: lower leaves obovate, 1 to 10 cm. long, two thirds as broad, usually cuneate at the base into a narrowly winged petiole, rarely rotund, glabrous upon either surface, margins crenate-dentate; stem-leaves sessile, pinnatifid or pinnatisect: inflorescence cymose-corymbose, not infrequently subumbellate: achenes glabrous.—Muhl. ex Willd. Sp. Pl. iii. 1999; DC. Prodr. vi. 432; Ell. Sketch, ii. 329; Britton & Brown, Ill. Fl. iii. 478, f. 4041. *S. aureus*, var. *obovatus*, Torr. & Gray, Fl. ii. 442; Gray, Syn. Fl. i. part 2, 391. — VERMONT, Pownal, Eggleston, no. 264: MASSACHUSETTS, Boxford, *Faxon* (coll. of 22 June, 1878): CONNECTICUT, Southington, *Bissell*, no. 344. This species reaches its greatest development and variation in the Southern States.

= = Lower leaves oblong-ob lanceolate to subspatulate, gradually narrowed at the base.

a. Achenes usually glabrous; lower leaves comparatively short-petiolate.

5. *S. BALSAMITAE*, Muhl. Stems 1.5 to 3 dm. high, floccose-tomentose at the base, glabrous or nearly so above, often retaining loose tomentum in the leaf-axils: lower leaves commonly oblong-ob lanceolate, 1 to 4 cm. long, 0.5 to 1.5 cm. broad, gradually narrowed below

into the petiole, crenate-dentate, frequently pubescent beneath when young, later glabrate, or glabrous from the beginning; stem-leaves more or less lyrate-pinnatifid, the uppermost sessile and much reduced: heads 1 cm. or less high: achenes usually glabrous.—Muhl. ex Willd. Sp. Pl. iii. 1998; DC. Prodr. vi. 432; Britton & Brown, Ill. Fl. iii. 479, f. 4043. *S. aureus*, var. *Balsamitae*, Torr. & Gray, Fl. ii. 442; Gray, Syn. Fl. i. part 2, 391, in part; Watson & Coulter in Gray, Man. ed. 6, 293, mainly.—MAINE, mouth of Aroostook River, Ft. Fairfield, *Fernald*, no. 71; Orono, *Fernald* (coll. of 1 July, 1890); valley of Piscataquis River, Dover, *Fernald*, no. 118; valley of the St. John River, Fort Kent, *Fernald*, no. 2406: VERNONT, Colchester, *Oakes*: MASSACHUSETTS, *Oakes*.

*var. pauperculus* (Michx.) Fernald in herb. Smaller, sometimes barely more than 3 cm. high: heads fewer, not infrequently reduced to one: plant with generally reduced habit and of northern range.—*S. pauperculus*, Michx. Fl. ii. 120.—MAINE, Pamedumcook Lake, *J. W. Chickering* (coll. of 10 August, 1881); Lower Penobscot Valley, Old Town, *Fernald* (coll. of 18 September, 1897).

b. Achenes hirtellous-pubescent: lower leaves long-petiolate.

*var. praelongus*. Stems 2 to 5.5 dm. high, usually conspicuously floccose-woolly at the base: lower leaves long petiolate, oblong-ob lanceolate, 1.5 to 6 cm. long, 10 to 12 mm. broad: stem-leaves rather large, even to 1 dm. in length, and 2 cm. in breadth, pinnatifid with rather remote lobes and rounded sinuses; achenes hirtellous-pubescent upon the angles.—MASSACHUSETTS, in rocky woods near the summit of Blue Hill, 9 June, 1895, *Wm. P. Rich*: VERNONT, Manchester, *Miss Mary A. Day*, no. 210: NEW YORK, Watertown, *specimen ex herb. Wm. Boott*.

This variety has hitherto passed as *S. aureus*, var. *Balsamitae*, of authors, but it is a somewhat stouter plant with longer petiolate lower leaves, and with more pronounced stem-leaves than in typical specimens of the species proper. It is somewhat intermediate between the northern *S. Balsamitae*, Muhl, and the southern *S. Smallii*, Britton.

\* \* Introduced species: heads inconspicuously radiate, or rayless.

← Pubescence viscid-glandular.

6. *S. VISCOsus*, L. A strong-scented annual, viscid-pubescent throughout, 2 to 4 dm. high, usually branched from the base: leaves half-clasping, 3 to 6 cm. long, two-thirds as broad, once or twice pinnatifid with rounded sinuses and angulate-sinuate lobes: head radiate; rays minute: achenes glabrous. — Sp. ii. 868, & ed. 2, 1217;

Engl. Bot. t. 32; Fl. Dan. t. 1230; Gray, Syn. Fl. i. part 2, 394; Britton & Brown, Ill. Fl. iii. 483, f. 4054 — MAINE, Mt. Desert Island, *Rand*, and adjacent coast: MASSACHUSETTS, vicinity of Boston, *Wm. Boott* (coll. of Sept., 1879); CAMBRIDGE, *B. L. Robinson* (coll. of 1 Sept., 1897); RHODE ISLAND, near Providence, *J. W. Congdon* (coll. of 4 Sept., 1874); *W. W. Bailey* (coll. of 1876).

+ + Pubescence not glandular.

++ Heads usually with short inconspicuous rays: involucre barely calyculate.

7. *S. SYLVATICUS*, L. Stems erect, 1 to 4 dm. high, simple or branched, usually somewhat pubescent: lower leaves petioled and more or less lyrate, the upper pinnatifid with unequal lobes, sessile, clasping and slightly sagittate, 2 to 15 cm. long, 1 to 8 cm. broad: inflorescence naked or nearly so: heads cylindrical; involucre barely calyculate with few and inconspicuous scales: ligules barely surpassing the disk-flowers (or none?): achenes canescent. — Sp. ii. 868, & ed. 2, 1217; Eng. Bot. t. 748; Fl. Dan. t. 869; Gray, Syn. Fl. i. part 2, 394; Britton & Brown, Ill. Fl. iii. 482, as to description. — MAINE, Mt. Desert Island and Southport, *Fernald*.

++ ++ Heads rayless: involucre conspicuously calyculate with short black-tipped scales.

8. *S. VULGARIS*, L. Stems 1 to 4 dm. high, essentially glabrous, or subfloccose-pubescent especially in the axils of the leaves and in the inflorescence: leaves pinnatifid, more or less lyrate, with angulately toothed divisions, sessile and subclasping, 2 to 8 cm. long: heads discoid: achenes puberulent along the angles. — Sp. ii. 867, & ed. 2, 1216; Fl. Dan. t. 513; Eng. Bot. t. 747; Gray, Syn. Fl. i. part 2, 394; Britton & Brown, Ill. Fl. iii. 482, f. 4053. — MAINE, Blaine, *Fernald* (coll. of 12 Sept., 1896); VERMONT, Rutland, *Eggleson*: MASSACHUSETTS, Ipswich, *Oakes*; Swampscott, *C. A. Weatherby* (coll. of 21 June, 1897); Revere Beach, *Greenman*, no. 515, RHODE ISLAND, Providence, *Thurber* (coll. of 1844); CONNECTICUT: Southington, *Andrews* no. 1.

BERLIN, GERMANY.

## FOSSOMBRONIA SALINA IN CONNECTICUT.

ALEXANDER W. EVANS.

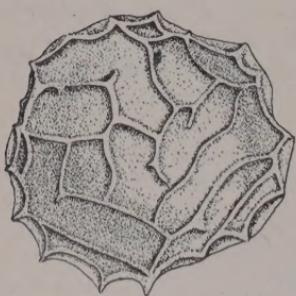
THE various species of *Fossombronia* resemble one another so closely in their vegetative characters, that it is, in most cases, a questionable policy to describe new species from specimens whose capsules

and spores are not fully developed. The history of the present species, which has remained practically unknown for twenty-five years, will serve to emphasize this fact.

In 1872, Austin distributed, as *Fossombronia angulosa* Raddi,<sup>1</sup> a plant which he reported as common in brackish meadows, without giving any more definite indication of the locality where his specimens were found. It is probable, however, that the plants were collected in New Jersey, as they are listed in Britton's Catalogue of New Jersey Plants. In the two sets of Austin's exsiccatae which I have been able to examine, the specimens are quite destitute of mature capsules. Some of the stems, however, show sexual organs, among which are fertilized archegonia. As Austin noted that the plant matured in early spring, it is evident that these specimens were collected in late summer or early autumn before the sporophytes had had time to develop. In 1875, Lindberg,<sup>2</sup> in commenting on Austin's exsiccatae, asserts that these specimens do not agree with the true *Fossombronia angulosa* of Europe, but differ from it in being paroicous instead of dioicous. Although no other difference is mentioned, the specimens in Lindberg's set also being apparently without capsules, they are designated as *Fossombronia salina* n. sp. Since this time nothing new has been written about this imperfectly described plant, although attention is called to it by both Underwood<sup>3</sup> and Stephani,<sup>4</sup> who place it among the doubtful members of the genus.

A number of years ago, in August, the writer collected a large

*Fossombronia* in a swamp in East Haven, Connecticut, perhaps half a mile from the salt water. The specimens were without capsules but showed well developed antheridia and archegonia on the same stem. Several years afterward upon visiting the locality late in May, numerous plants were found with somewhat immature capsules. These developed readily upon being brought into the laboratory and soon showed fully ripened spores. These specimens agree



Spore of *Fossombronia salina*  $\times 730$ .

with Austin's in their large size, in their monoicous inflorescence and

<sup>1</sup> Hep. Bor.-Amer. no. 119.

<sup>2</sup> Acta Soc. Sci. Fenn. 10: 533.

<sup>3</sup> Bot. Gazette, 21: 70. 1896.

<sup>4</sup> Mem. de l' Herb. Boissier, 16: 40. 1900.

in the season of the year in which they mature their spores. They agree also in the unsatisfactory characters drawn from the vegetative structure of the gametophyte, such as the outline of the stem-section, the shape of the leaves and the average size of the leaf-cells. Although these points of resemblance are not all that we might desire in the present genus, they seem sufficient to justify us in referring these East Haven specimens to Austin's *F. angulosa* and hence to Lindberg's *F. salina*.

Closely agreeing with the Connecticut plants and apparently referable to the same species, are the specimens from Florida, distributed by Underwood and Cook as *F. angulosa*.<sup>1</sup> These specimens, which were collected in March, are a little past maturity. They seem to have lost all signs of antheridia but show characteristic spores. Through the kindness of Professor Underwood, I have had the privilege of examining younger specimens of the same plant collected in January. On some of these, the capsules are just maturing, but there are also young branches present which exhibit both antheridia and archegonia, showing that the inflorescence is monoicous. It would appear as if the season for the ripening of the spores were a little less definite in Florida than farther north, but this might easily be accounted for by the differences in climate.

Although *Fossombronia salina* is known from so few localities, it will probably be found at intermediate stations along the Atlantic coast. The following description, drawn from spore-bearing material, will aid in its recognition :

*FOSSEOMBRONIA SALINA* Lindb. *Acta Soc. Sci. Fenn.* 10: 533. 1875.

*F. angulosa* Aust. *Hep. Bor.-Amer.* no. 119. 1872 (not Raddi).

Heteroicous: scattered or caespitose, dark green becoming paler or brownish with age: stems dichotomous, 1 cm. or more long, 0.3 mm. in diameter and about 10 cells thick, prostrate, closely adherent to the soil by means of numerous deep purple rhizoids, upper surface plane or slightly convex, lower surface strongly convex or carinate: leaves more or less imbricated except on attenuate axes, 1-1.3 mm. long, more variable in width, 1 cell thick except at the very base, quadrate-oblong from a broad, slightly decurrent base, apex broad, indistinctly lobed and crisped, the lobes very variable, mostly rounded but sometimes apiculate or acute: leaf-cells very variable in size, averaging  $37 \times 28 \mu$  on edge of leaf,  $60 \times 30 \mu$  in the middle and  $70 \mu$  at the base: pseudoperianth about 1.5 mm. high, turbinated, slightly and irregularly sinuate-lobed and

<sup>1</sup> *Hep. Amer.* no. 118.

crispate at the mouth, the lobes rounded, entire: capsule borne on a short stalk; spores 41-48  $\mu$  in diameter, brown, in some cases regularly reticulate with 11-13 polygonal meshes on convex face, usually irregularly furcate-lamellate without distinct meshes; lamellae low and thin, deeply pigmented in lower part and in the regions of anastomosis, often paler on the edges, projecting slightly on the margins of the spore as short, often indistinct points; elaters very irregular, with 2 or 3 spirals.

East Haven, Connecticut (Evans). New Jersey (Austin). Eustis, Florida (Underwood).

*Fossombronia salina* differs from *F. angulosa* in its inflorescence and in its leaf-cells, which are not markedly elongated at the base of the leaf. The spores of the European species also are a little smaller, they are very regularly reticulate with fewer meshes (mostly 7 to 10 on the convex face of the spore), the lamellae are higher and thinner, and their pale free margins are very distinct, appearing as a translucent wing on the margin of the spore.

Of the two other species of *Fossombronia* which have been found in New England, the common *F. foveolata* Lindb. (*F. Dumortieri* Lindb.) bears the most resemblance to *F. salina*. This species, however, is smaller and is an annual, developing its sexual organs in the summer and its capsules in the autumn of the same year. Its spores are very like those of *F. salina* and are of about the same size, but they tend to be more regularly reticulate, and the meshes of the reticulum are smaller and more numerous (usually numbering from 15 to 20 on the convex face of the spore). The much rarer *F. Wondraczekii* (Corda) Dumort. (*F. cristata* Lindb.), now known from both New Hampshire and Connecticut, is also an annual plant, similar in general appearance to *F. foveolata*. Its spores are a little smaller than those of *F. salina* and have very different markings; their lamellae, which are much finer and more numerous, tend to be parallel as seen from one side of the spore but anastomose somewhat in the middle of the convex face, often forming a few irregular meshes in this region.

YALE UNIVERSITY.

## THE IDENTITY OF THE LINNAEAN GNAPHALIUM PLANTAGINIFOLIUM.

B. L. ROBINSON.

PERHAPS none of the recent segregations among American flowering plants has been more surprising in extent and interest than the division of *Antennaria plantaginea*, R. Br. (*A. plantaginifolia*, Hook.). Long regarded as a single variable species, this polymorphous plant, familiar in our spring flora, has, upon close scrutiny, fallen into many rather well-marked and tolerably distinct species. Thanks to the observations and publications of Prof. Greene and Messrs. Fernald, Rydberg, and E. Nelson, the characteristics and affinities of the newly recognized forms are already pretty well known, yet, as in all such cases, the actual identity of the original type must be settled before the subsequently described segregates can have a fixed or definite status. In this instance the central species and historic type of the group rests upon the Linnaean *Gnaphalium plantaginifolium*, published in the *Species Plantarum* in 1753, and since the subdivision, no one has, I believe, been in a position to do more than guess at the identity of the Linnaean type. This has been due in part to the brevity and general nature of the original description, but chiefly to the lack of authenticated specimens upon this side of the Atlantic where the chief knowledge of the segregates exists. The first supposition regarding the Linnaean type was that of Prof. Greene, who regarded it as probably the plant (with leaves glabrous above) which he later described as *A. arnoglossa*. Mr. Fernald, on the other hand, regarded it as the commonest of the large-leaved *Antennarias*, a species which has a white flocculent pubescence upon the upper, as well as a denser, firmer pubescence on the lower surface of the leaves. This plant has been described by Prof. Greene as *A. decipiens*.

Last September I had an opportunity, while in London, to examine the extant material of the original *Gnaphalium plantaginifolium*, and found it to be a mixture. To make clear the relation of its elements, it will be best to reproduce the treatment in the first edition of the *Species Plantarum*. It is as follows:

*Gnaphalium caule simplissimo, foliis radicalibus ovatis maximis, sarmen-tis procumbentibus.*

*Gnaphalium stolonibus reptatricibus longissimis, foliis ovatis, caule capitulo.* *Gron. virg. 95.*

*Gnaphalium, plantaginis folio, virginianum.* *Pluk. Alm. 171, t. 348. f. 9.*

*Habitat in Virginia. 24.*

*Habitus omnino praecedentis; sed Folia radicalia pollice majora, ovalia.* *Vidi solam feminiam; an praecedentis sola varietas?*

From an examination of this description it will be seen that the species rests upon three plants, namely, 1) the plant of Clayton, described by Gronovius, whose words, "*Gnaphalium stolonibus reptatricibus,*" etc., are quoted by Linnaeus; 2) the plant of Plukenet, mentioned in the Almagestum as "*Gnaphalium plantaginis folio,*" etc., and crudely figured in the same work, t. 348, f. 9; 3) the plant which Linnaeus himself examined and which suggested the words in the first lines, "*Gnaphalium caule simplissimo, foliis radicalibus ovatis maximis, sarmentis procumbentibus,*" also the closing expressions regarding the habit.

Clayton's plant, definitely cited by Gronovius<sup>1</sup> as no. 287 was readily found in the herbarium of the British Museum of Natural History and proved to be neither species associated by recent American writers with the Linnaean *Gnaphalium plantaginifolium*. With solitary large terminal head and elongated slender stolons, in length exceeding the flowering stem, it was clearly the southern *A. solitaria*, Rydberg. The Plukenet plant was sought in vain even with the efficient assistance of Messrs. Carruthers, Hierns, and E. G. Baker, to whose courteous aid I am much indebted. As the fullest, if not the only, set of Plukenet plants is preserved at the British Museum, it is probable that as this plant is lacking there it is not extant. There is no evidence, as I am informed by Mr. Carruthers, that Linnaeus saw this plant of Plukenet, and there is positive proof that he did not see the plant of Clayton, for that is stamine, while Linnaeus expressly says that he had seen only the pistillate form. To learn just what Linnaeus had seen I examined the representation of *Gnaphalium* in his own herbarium, preserved in the rooms of the Linnaean Society of London, and there found a sheet of *Gnaphalium plantaginifolium*, clearly labeled in Linnaeus' own hand, but unfortunately without any indication of the collector. It bears two specimens evidently alike and both pistillate. Moreover, through the partial loss of their large lower leaves they present no slight

<sup>1</sup> *Flor. Virg. ed. 1, 95.*

habital resemblance to *Gnaphalium dioicum*. There can, therefore, be no reasonable doubt that these were the specimens which furnished to Linnaeus the characteristics recorded in the uncompiled (i. e., first and last) portions of his description and which, therefore, must be regarded as the types of the species. These specimens are precisely *A. plantaginea* as interpreted by Mr. Fernald (the *A. decipiens* of Prof. Greene). Regarding the identity of the Plukenet plant, there is certainly nothing either in the description or figure to prove it different from the plant of Linnaeus. It was, from the figure, surely not the same as the plant of Clayton, which has much longer stolons and obovate leaves, rounded, not pointed, at the apex. However, in comparison with the plant which was actually examined by Linnaeus and which seems to have furnished him the information contained in the original (uncompiled) portions of his description, neither the plant of Clayton, which he did not see, nor the plant of Plukenet, which he probably did not see, can have any great weight in determining the identity of the species. The brief pre-Linnaean descriptions of these two plants are cited by Linnaeus after his own technical description and merely as supposed synonyms. The fact that at least one of these quoted expressions proves not to be synonymous, certainly cannot invalidate or alter the species as conceived and described by Linnaeus from the material at his command.

GRAY HERBARIUM.

MONARDA FISTULOSA AND ITS ALLIES.

M. L. FERNALD.

THE plants which have long been referred to *Monarda fistulosa* have recently been treated in very dissimilar ways by different authors. Dr. Gray in the Synoptical Flora regarded them all as phases of one polymorphous species, *M. fistulosa*, L., recognizing besides *M. fistulosa* three varieties, var. *rubra* (*M. purpurea*, Pursh), var. *media* (*M. media*, Willd.), and var. *mollis*, Benth. (*M. mollis*, L.). In the Illustrated Flora, however, Dr. Britton recognizes three species, *M. fistulosa*, L. (including *M. mollis*, L.), *M. media*, Willd. (*M. fistulosa*, var. *rubra*, Gray), and *M. scabra*, Beck (including *M. fistulosa*, var. *mollis*, Benth., in part). In view of these divergent

treatments, especially of the Linnaean *M. mollis*, Dr. Robinson while in London the past summer, examined the material of *M. fistulosa* and *M. mollis* in the Linnaean herbarium. There he found two sheets pinned together. One of these was marked "1" by Linnaeus and had later been marked in another hand (presumably of Sir James Edward Smith) "*fistulosa*." It was the custom of Linnaeus to number the sheets in his herbarium to agree with the numbers of the species in his *Species Plantarum*, and his "1" may thus be taken to indicate *M. fistulosa*, the first of the genus mentioned in *Species Plantarum*. This plant which represents the species apparently intended by Linnaeus as *M. fistulosa* has a hirsute stem and oblong-lanceolate finely and regularly serrated leaves which are hirsute on the midnerve and soft-pubescent on the surface beneath. In these characters the plant agrees well with a specimen collected by Dr. J. K. Small in middle Holston Valley, Virginia, July 20, 1892, and compared by Dr. Robinson with the Linnaean specimen.

The second sheet is of a plant cultivated at Upsal, and marked by Linnaeus "*H. U. fistulosa*." In the same hand, however, is the word "mollissima." This plant has canescent appressed (not hirsute) pubescence and it agrees with a Maine specimen collected by Mr. J. C. Parlin and compared by Dr. Robinson with the Linnaean plant. Considering the phrase in the original characterization: "Simillima *M. fistulosae*, at caule duplo majore, minime piloso ut in illa," and the "mollissima" written by Linnaeus upon the sheet, we are justified in considering the second specimen the type of *M. mollis*.

The confusion surrounding the name *Monarda mollis* began with Willdenow whose plant, at least as distributed from the Paris Garden in 1814, has the spreading pubescence of the Linnaean *M. fistulosa*. Bentham, too, applied the name *mollis* to plants different from the Linnaean species. His *M. fistulosa*, var. *mollis* was based upon *M. mollis*, L. and *M. menthaefolia*, Graham, two plants of rather different habit; while a sheet of specimens in the Gray Herbarium, sent out by Bentham to illustrate the *Genera and Species of Labiateae*, contains branches of both *M. mollis* and *M. fistulosa* of Linnaeus. Thus it is not surprising that the name *Monarda mollis* should have been of doubtful significance in our flora. Dr. Gray in his study of the group for the *Synoptical Flora*, seems to have interpreted the original plants correctly, but the minutely canescent *M. mollis* of Linnaeus is so constant in the character of its pubescence that its recognition as

a species distinct from *M. fistulosa* is probably justified. *M. menthaefolia*, Graham, a simple-stemmed plant of the Rocky mountains, generally united by authors with *M. mollis*, is habitually so well marked as to deserve treatment as a variety, although it lacks any other constant character to separate it specifically from that plant.

*Monarda fistulosa* and *M. media*, on the other hand, do not present any constant character by which they can be clearly separated. *M. fistulosa* in its typical form has lilac or salmon-pink corollas, and the spreading pubescence is well developed on the branches, while *M. media* has deep purple or crimson flowers and the spreading pubescence is confined chiefly to the leaves and their petioles. Numerous intermediate forms occur, however, so that the two plants can be considered only extreme varieties of one species.

The plants of the *fistulosa* group may now be treated as follows:

\* Pubescence, at least of the petioles and midnerves (beneath) of the leaves, hirsute or long-villous, spreading.

**M. FISTULOSA**, L. Branches usually hirsute or villous: corolla lilac or salmon-pink.—Sp. 22; Benth. Lab. 316; Gray, Syn. Fl. ii. 374; Britton & Brown, Ill. Fl. iii. 103, except as to syn. *M. mollis*, Willd. Enum. 32; Britton & Brown l. c. as to syn.; not L.—New Hampshire to Texas and the Rocky Mountains. Often cultivated, and only a roadside escape in New England.

Var. **RUBRA**, Gray. Branches usually not hirsute nor villous: corolla deep purple or crimson.—Gray, l. c. *M. media*, Willd. l. c.; Britton & Brown, l. c. *M. fistulosa*, var. *media*, Gray, l. c.—Maine to North Carolina, Tennessee and Ohio. Often cultivated and perhaps not indigenous in New England.

\*\* Pubescence minute, appressed, the leaves canescent, especially beneath.

**M. MOLLIS**, L. Mostly tall and branching: throat of calyx very densely white-bearded: corolla lilac.—Amoen. Acad. iii. 399. *M. scabra*, Beck, Am. Jour. Sci. x. 260; Britton & Brown, l. c. *M. fistulosa*, var. *mollis*, Benth. l. c. 317, in part; Gray, l. c. (except as to syn. *M. menthaefolia*). *M. fistulosa*, Britton & Brown, l. c., as to syn.—Maine to the Saskatchewan, Oregon, and Texas.

Var. **menthaefolia**. Simple or rarely a little branching: calyx usually less bearded at the throat.—*M. menthaefolia*, Graham, Edinb. Phil. Journ. 1829, 347; Hook. Bot. Mag. lvii. t. 2958. *M. fistulosa*, var. *mollis*, Benth. l. c.; Gray, l. c.; in part. *M. stricta*, Wooton, Bull. Torr. Club, xxv. 263.—MANITOBA, Brandon, July 8, 1894 (John Macoun): MONTANA, Bitterwood Valley, July 27, 29, 1880 (S. Watson, no. 329): IDAHO, Kootenai, 1861 (Lyall); Lake Pend

d' Oreille, Aug. 1, 1892 (*Sandberg, MacDougal & Heller*, no. 817) : NEVADA, Reno (received from Thomas Meehan) : COLORADO, Piedra, July 12, 1899 (*C. F. Baker*, no. 572) : NEW MEXICO, without locality, 1847 (*Fendler*, no. 603) ; Santa Fé Cañon, alt. 2460 m., July 2, 1897 (*A. A. & E. G. Heller*, no. 3798) ; White Mountains, alt. 2160 m., Aug. 1, 1897 (*E. O. Wooton*, no. 267) ; Chama, Sept. 5, 1899 (*C. F. Baker*, no. 570) : ARIZONA, Willow Spring, alt. 2200 m., July, 1874 (*J. T. Rothrock*, no. 242), July 5, 6, 1890 (*Edw. Palmer*, no. 626) ; Fort Apache, June 21-30, 1890 (*Edw. Palmer*, no. 579) ; vicinity of Flagstaff, alt. 2160 m., July 8, 1898 (*D. T. MacDougal*, no. 258). — The original specimen from Drummond was probably from Norway House on the Saskatchewan and is approached by Bourgeau's plant from that region which, however, has the throat of the calyx more densely bearded than in the Rocky Mountain plants or as shown in the original plate of the Drummond plant.

GRAY HERBARIUM.

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THE CORRECT DISPOSITION OF *SISYMBRIUM NIAGARENSE*. — In his monograph of the genus *Sisymbrium* Eugène Fournier described in 1865<sup>1</sup> a new species, *S. niagarense*, collected at Niagara and said to be nearly related to the common hedge-mustard, *S. officinale*. Indeed, Fournier ventured the suggestion that it might be the *S. officinale* of Pursh and of Elliott. Unable from the description to place the plant more accurately and equally unable to identify it with any particular form of *Sisymbrium* from central North America, Dr. Gray<sup>2</sup> early suggested that it probably was only a form of *S. officinale*. This view (properly guarded by a mark of interrogation) was repeated in the Synoptical Flora and by Dr. Watson in his Bibliographical Index, while in the Index Kewensis the identity of *Sisymbrium niagarense* and *S. officinale* is recorded without any qualification.

On visiting the Jardin des Plantes in Paris, last July, the writer was permitted, through the kindness of Prof. Bureau and the staff of the herbarium, to examine Fournier's type. This, however, proved to be *Brassica nigra*, Koch, the common black mustard. To make the identity doubly certain, the specimen was subsequently reexamined by the writer in company with M. Danguy of the Botanical

<sup>1</sup> Recherches anatomiques et taxonomiques sur la famille des Crucifères et sur le genre *Sisymbrium* en particulier; Paris, 4to., 1865.

<sup>2</sup> Am. Journ. Sci. ser. 2, xlvi. 278.

Museum at Paris. Although the specimen lacks the lower leaves there can be no doubt whatever that it is *Brassica nigra* and that it bears the original label of Fournier. Furthermore the specimen corresponds so closely to the description of *S. niagarensis* that there can be no reason to suspect a confusion of specimens and labels. The name *S. niagarensis*, Fourn., may, therefore, be transferred from the synonymy of *S. officinale*, L., to that of *Brassica nigra*, Koch, and one more question mark, of some years' standing, may thus be eliminated from American systematic botany.—B. L. ROBINSON.

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THE VEGETATION OF PLYMOUTH THREE HUNDRED YEARS AGO.—In the Rev. Alexander Young's "Chronicles of the Pilgrim Fathers from 1602-1625" there is a short account of the natural productions of the Plymouth shore. The vegetation is thus described:

"The land for the crust of the earth is a spit's depth, excellent black mould, and fat in some places; and vines everywhere, cherry-trees, plum-trees, and many others which we know not. Many kinds of herbs we found here in the winter, as strawberry leaves innumerable, sorrel, yarrow, carval, brooklime, liverwort, water-cresses, great store of leek and onions, and an excellent kind of flax or hemp."

Only three of the plants mentioned seem to require comment. What plant is intended by "carval" I do not know. Possibly the word is a variant of "carvies," said to be a vernacular name for *Carum Carui*, L. If this be the case the observer must have mistaken some indigenous Umbellifer for the European species, as he might easily do. It seems less probable that he could have failed to recognize two such familiar herbs as sorrel and water-cress, or have intended by those names any other plants than *Rumex Acetosella*, L., and *Nasturtium officinale*, R. Br.

Yet botanists agree in considering both as introduced species in North America. This testimony throws the date of the introduction very far back. When and by what means had they migrated, that the Pilgrims should find them already in possession of the virgin soil?

It appears probable that some curious and useful information concerning the primeval vegetation of the Atlantic coast might be gleaned from the accounts of contemporary writers. But this research, perhaps, may already have been made.—S. B. PARISH, San Bernardino, California.

TUMBLE-WEEDS.—In many instances the fact whether an annual plant be a tumble-weed or not, depends upon the conditions of its growth and exposure to strong winds. This is well illustrated by the following example. In the thin grass near trees at the Michigan Agricultural College, *Trifolium procumbens* has grown for thirty years or more without showing any symptoms of acting as a tumble-weed. In a grass garden begun on stiff clay in 1888 a patch two yards square of this clover was planted and kept free from grass and weeds. The clover plants became larger than usual and in autumn, to my surprise, they broke loose from the soil and went nicely with the wind for some distance.

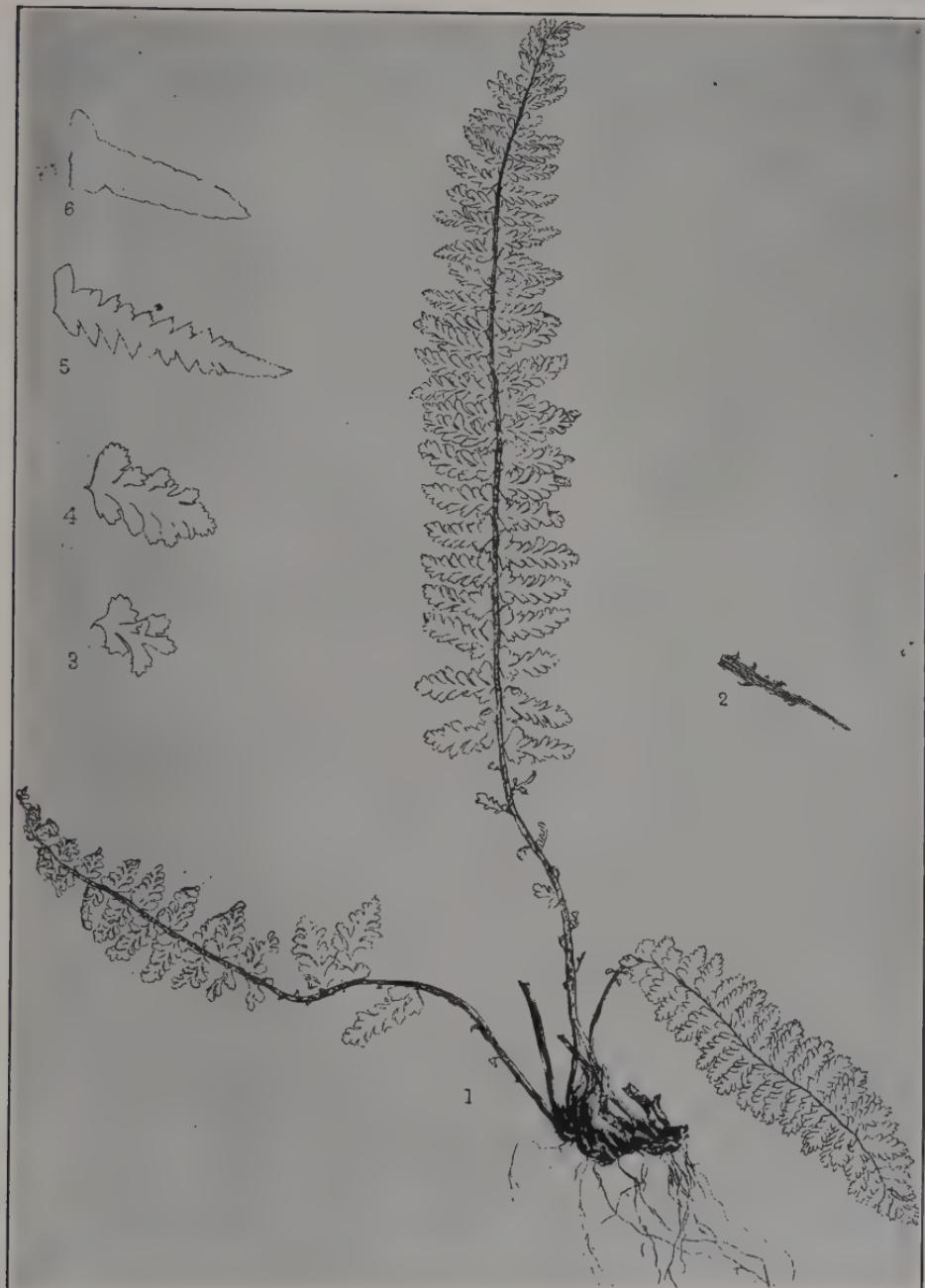
In central Michigan I have seen the following plants act as tumble-weeds, and they all now grow or may soon arrive in many parts of New England.

<i>Amaranthus albus.</i>	<i>Trifolium procumbens.</i>
<i>Panicum capillare.</i>	<i>Cycloloma platyphyllum.</i>
<i>Agrostis scabra.</i>	<i>Oenothera biennis.</i>
<i>Lepidium apetalum.</i>	<i>Gypsophila elegans.</i>
<i>Salsola Tragus.</i>	

This fall in clearing off the tops of *Statice Limonium*, where a clump of it grew in the Botanic Garden, I observed that the old stems were decayed near the ground and made no resistance as the cluster of stiff tops were taken hold of. Here, I thought, is another tumble-weed, for all it lacks is a good breeze. This observation on Statice makes me wish to hear from botanists of New England regarding its habit on their coast. Can anyone enlarge the above list of plants? — W. J. BEAL, Michigan Agricultural College.

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CYCLOLOMA ON CAPE COD.—On August 22 last I collected in Orleans, Mass., a plant which was determined at the Gray Herbarium as *Cycloloma platyphyllum*, Moquin. It was growing in dry sand by the roadside, about half a mile from the railroad, and I did not notice more than the one plant. This seems to be a new and extralimital station for this plant, the ordinary range for which is from Manitoba westward and southward. — JOHN MURDOCH, Jr., Roxbury, Massachusetts.



Margaret Slosson, del.

*ASPLENIUM EBENEUM*, var. *HORTONAE*, n. var.



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